

# Replacement DELNI

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## Installation and Operating Information

Order Number: EK-DELNX-IN.A01

**Revision Update Information:** This is a new manual.

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**February 1992**

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- reorient the receiving antenna
- relocate the computer with respect to the receiver
- move the computer away from the receiver
- plug the computer into a different outlet so that computer and receiver are on different branch circuits.

If necessary, the user should consult the dealer or an experienced radio/television technician for additional suggestions. The user may find the following booklet prepared by the Federal Communications Commission helpful:

"How to Identify and Resolve Radio-TV Interference Problems."

This booklet is available from the US Government Printing Office, Washington, DC 20402, Stock No. 004-000-00345-4.

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# Preface

## OVERVIEW

This manual is intended for use by customers and Digital Services personnel who are installing, operating, and troubleshooting the replacement Digital Ethernet Local Network Interconnect (DELNI) unit.

This manual consists of the following:

- **Chapter 1** provides an overview of the replacement DELNI unit.
- **Chapter 2** provides instructions for installing the replacement DELNI unit on a tabletop.
- **Chapter 3** provides instructions for installing the replacement DELNI unit in a standard 19-inch (48.26-centimeter) rack.
- **Chapter 4** provides information on identifying problems with the replacement DELNI unit and how to fix these problems.
- **Chapter 5** provides information on the repair and support services that are available from Digital Equipment Corporation.
- **Appendix A** provides instructions for connecting cables to an Etherjack junction box.
- **Appendix B** provides cable length restrictions for the Ethernet controller.

## RELATED DOCUMENTATION

For more information, refer to the *Ethernet Installation Guide* (EK-ETHER-IN) and the appropriate Ethernet controller manuals.





# 1

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## Introduction

### 1.1 Replacement DELNI Background

The *replacement* DELNI unit is designed to provide the same functionality as the *original* DELNI unit. The replacement DELNI utilizes the newest technology available to increase reliability while maintaining high-quality standards. The metal box and removable plastic dress skins of the original DELNI have been eliminated with the design of a new plastic box for the replacement DELNI. This has eliminated the need to remove the plastic dress skins for a rackmount configuration.

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#### IMPORTANT

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The information in this manual deals with the replacement DELNI only. For ease of presentation, the replacement DELNI will be referred to as the DELNI.

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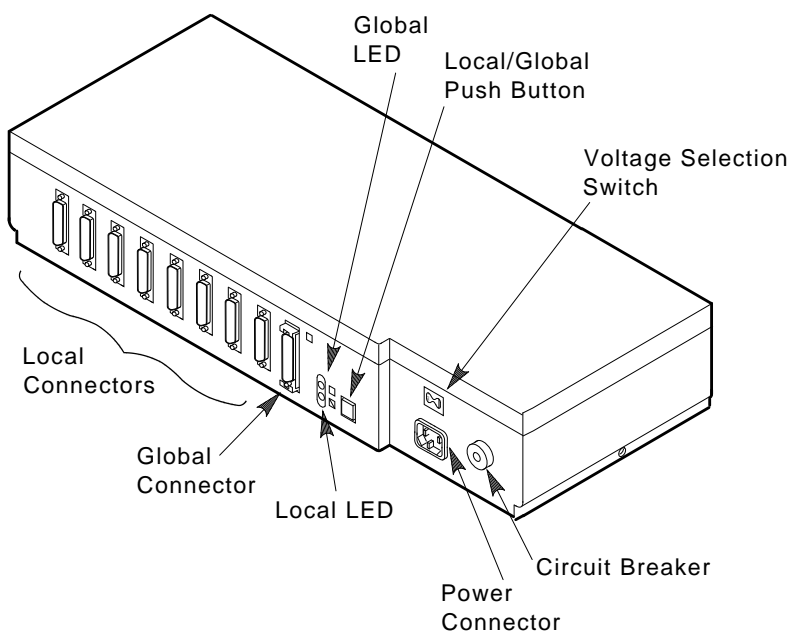
### 1.2 Overview

The DELNI (Digital Ethernet Local Network Interconnect) unit, shown in Figure 1–1, is an electronic device that permits workstations (Ethernet devices) to communicate by using the Ethernet network transmission system.

You do not need to know how Ethernet works to install the unit. You only need to follow the instructions for your workstations and network system software.

## Introduction

Figure 1-1 DELNI Unit



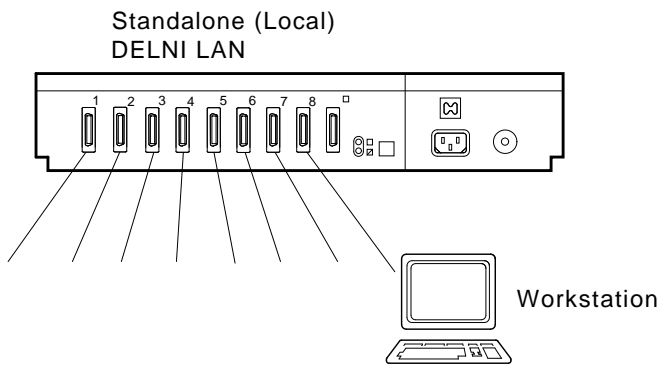
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This unit can work with DECnet or other Ethernet communication software. Under the Ethernet system, workstations communicate (without interfering with each other) by using a single coaxial cable. The network system is divided into levels of hardware and software with each level more technically sophisticated than the previous level. The DELNI unit is part of the lowest level (the physical level) of the Ethernet system; it has no adjustments.

### 1.3 DELNI Arrangements

You can connect up to eight workstations to a DELNI group called a standalone DELNI LAN (Local Area Network) (see Figure 1-2).

Figure 1-2 DELNI LAN

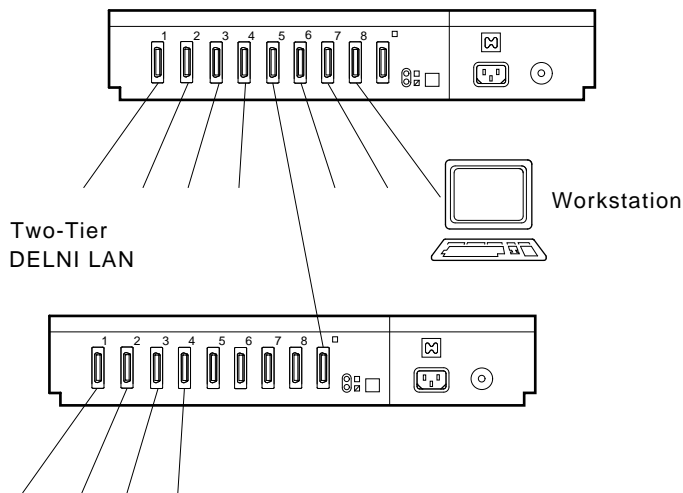


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## Introduction

If workstations in different DELNI LANs need to exchange information, you can connect DELNI units to each other as shown in Figure 1-3. One unit can connect to eight other DELNI LANs, which allows many stations to communicate with each other. You can still connect workstations to any of the eight DELNI device connectors.

**Figure 1-3 Cascaded DELNI Units**

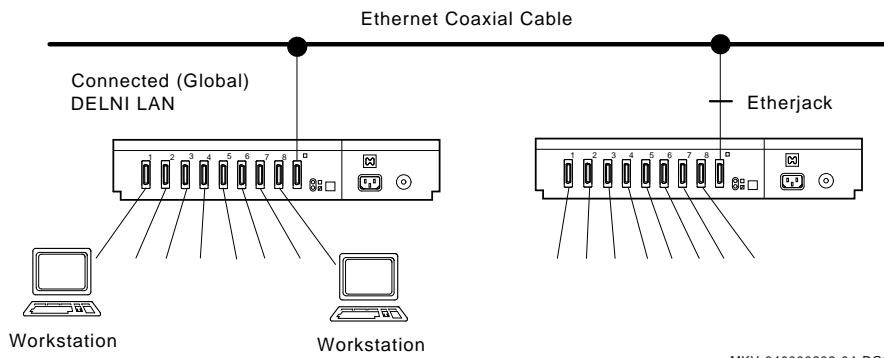


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## Introduction

If you plan to have a large Ethernet system that connects many workstations or covers a wide area, you can connect DELNI LANs to the Ethernet system by using an Etherjack junction box, or by attaching the DELNI LANs directly to an Ethernet network transceiver (see Figure 1–4). Refer to Appendix A for information on connecting to these devices.

**Figure 1–4 Wide Area Ethernet**



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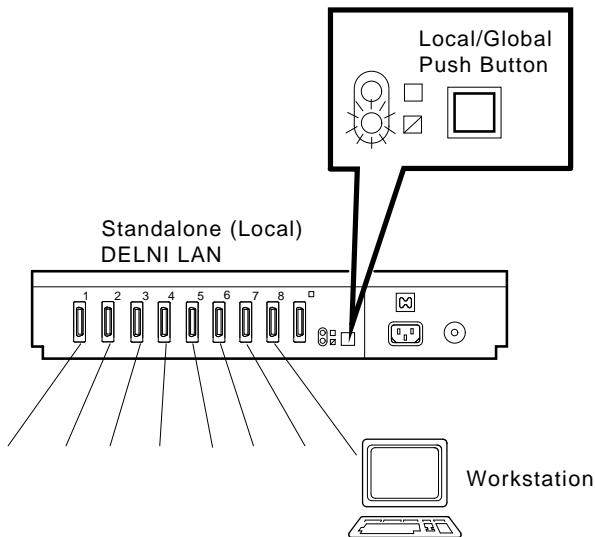
## Introduction

### 1.4 Standalone and Connected Operation

If you use either the two-tier or connected arrangement, you have to use the ninth connector. Next to this connector there are two LEDs and a two-position push button that disconnects the DELNI LAN from the larger system. This disconnection makes this DELNI LAN a standalone (local) arrangement when the green LED next to the  symbol is lit. There is no effect on the DELNI LAN or the larger network. You can reconnect the standalone DELNI LAN to the larger network at any time by pushing the push button until the green LED next to the  symbol is lit. Figure 1–5 shows a standalone configuration, Figure 1–6 shows a two-tier configuration, and Figure 1–7 shows a connected configuration.

You can add or remove workstations at any time, in either mode, without disturbing the network.

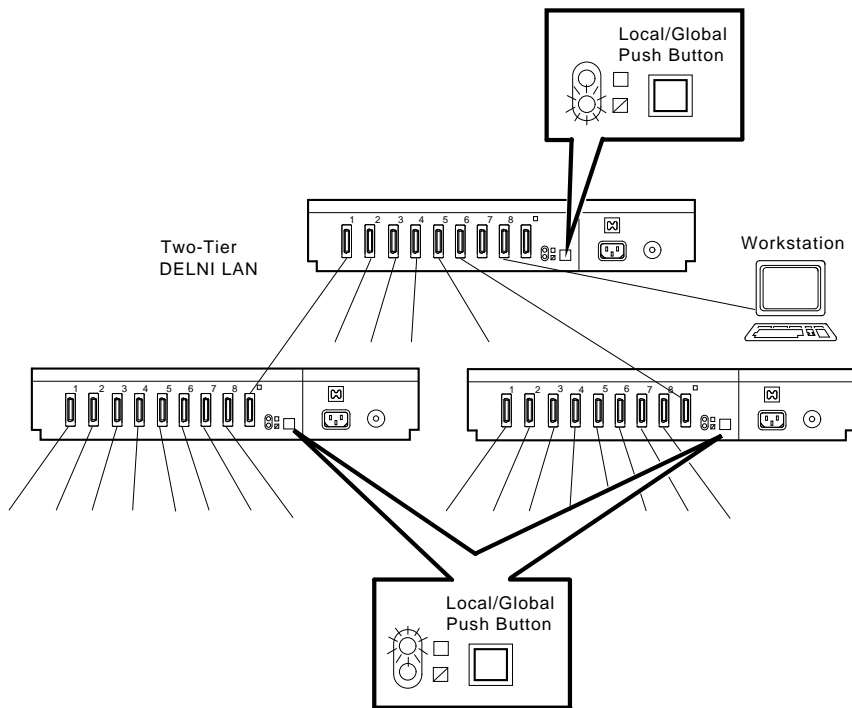
**Figure 1–5 Standalone DELNI LAN Configuration**



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## Introduction

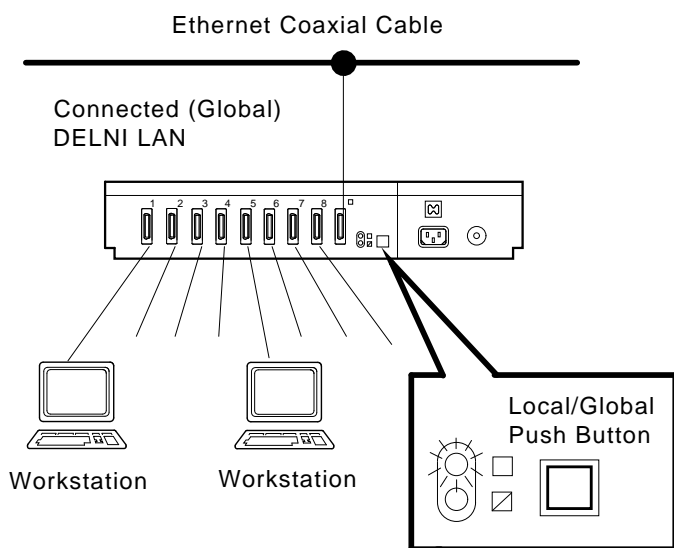
Figure 1-6 Two-Tier DELNI LAN Configuration



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## Introduction

Figure 1–7 Connected DELNI LAN Configuration



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## 1.5 General Installation

Chapter 2 explains how to install the DELNI unit on a tabletop. Chapter 3 explains how to mount the DELNI unit in a 19-inch (48.26-centimeter) rack. Before you install your unit, plan your arrangements. You need to know how long connecting cables can be so that you can better plan where to place the unit. For this information, refer to the manuals that come with the Ethernet controller modules for the workstations you want to connect. Refer to Appendix A for information on connecting to an Etherjack junction box and Ethernet network transceiver. Refer to Appendix B for information on Ethernet cable length restrictions.

Ensure that all the workstations are working correctly by running diagnostic tools on the workstations *before* you connect them to the unit.



## 1.6 Specifications

Refer to Table 1–1 for a list of the DELNI specifications.

**Table 1–1 DELNI Specifications**

Parameter	Value
Dimensions	8.26 cm (3.25 in) high (including feet) 44.5 cm (17.5 in) wide 17.8 cm (7.0 in) deep
Weight	2.6 kg (5.5 lb)
Connectors	8 (to workstations) 15-pin male D-connector 1 (to transceiver or DELNI unit) 15-pin female D-connector 1 (ac power) 3-conductor grounded
Electrical	
120 Vac	90 V to 128 V
240 Vac	180 V to 256 V
Frequency	47 to 63 Hz
Power	15 W (maximum)
Circuit breaker	2 A
Data transfer rate	10 Mb/second
Operating temperature range	5°C (41°F) to 50°C (122°F)



# 2

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## Tabletop Installation

### 2.1 Before You Start

First, ensure that all the workstations you plan to connect work correctly. Next, install the Ethernet controllers and then your workstation cables.

Cables are available with either straight or right-angle connectors. If you mount your unit on a tabletop, use straight connectors. If you rackmount your unit, use right-angle connectors.

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**NOTE**

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Check for any cable length restrictions by referring to the appropriate installation manual for each station's Ethernet controller and Appendix B of this document. Refer to the *Ethernet Installation Guide* for more information.

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**NOTE**

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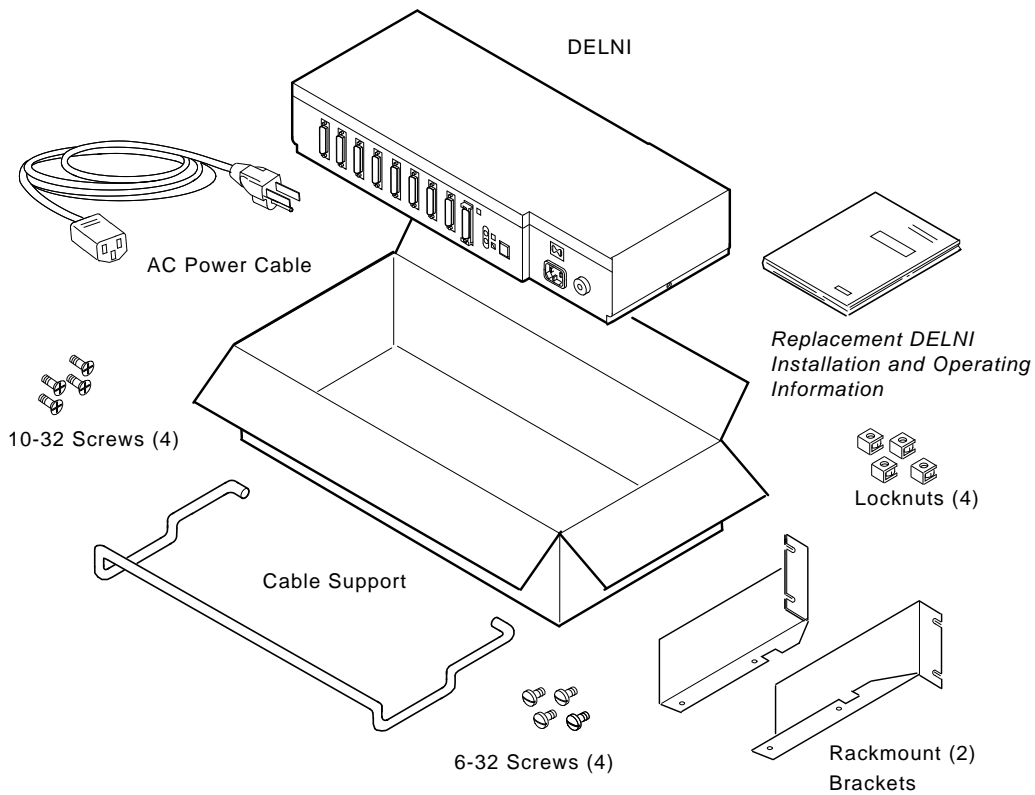
If you plan to connect the DELNI unit to another DELNI unit, an Ethernet transceiver, or an Etherjack junction box, you must have a separate cable (part number BNE3 or BNE4, ordered separately). Contact your Digital sales office or DECdirect for more information.

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## Tabletop Installation

1. Open the box and check the contents (see Figure 2-1). Save the box and shipping material.

Figure 2-1 DELNI Parts



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## Tabletop Installation

2. If there are any missing items:
  - Identify items
  - Contact your sales representative or delivery agent
3. If there is any damage:
  - Stop unpacking
  - Contact your sales representative and delivery agent
4. If you need help:
  - Call Digital at the phone number listed in Chapter 5.

### 2.2 Installing the Tabletop DELNI Unit

Place the DELNI unit in a convenient location.

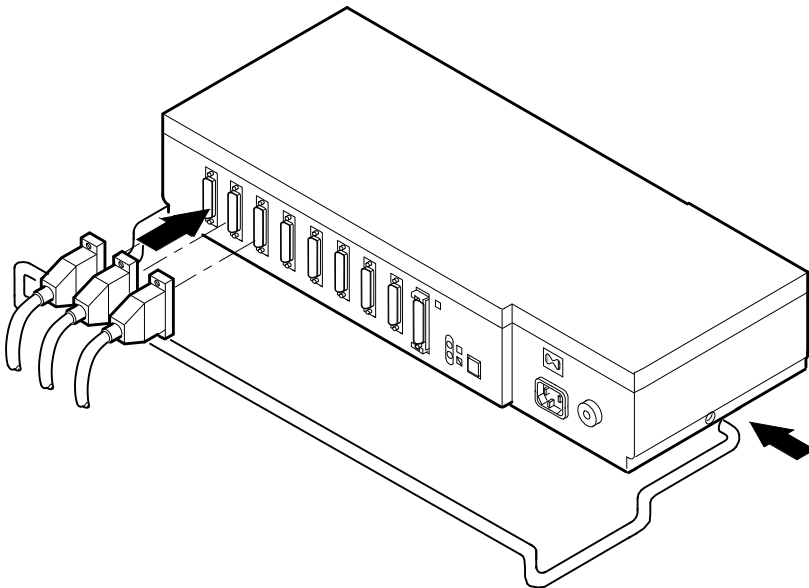
- Ensure that cables from the workstations can reach the unit.
- Place the unit within 2 meters (6 feet) of the power source. Do not use an extension cord.
- Avoid dusty locations.
- Avoid direct sunlight, heat vents, and warm air exhaust from other equipment.

## Tabletop Installation

1. Install the cable support by inserting the ends of the cable support into the holes provided on both sides of the DELNI unit (see Figure 2-2).

The DELNI unit is supplied with the cable support in order to provide stabilization to the unit and its connecting cables in the tabletop installation. With the cable support installed, as shown in Figure 2-2, the AUI cables can be tie-wrapped to the bar. This gives the total unit a larger footprint and helps prevent the unit from moving.

**Figure 2-2 Connecting the Cable Support and Ethernet Cables**

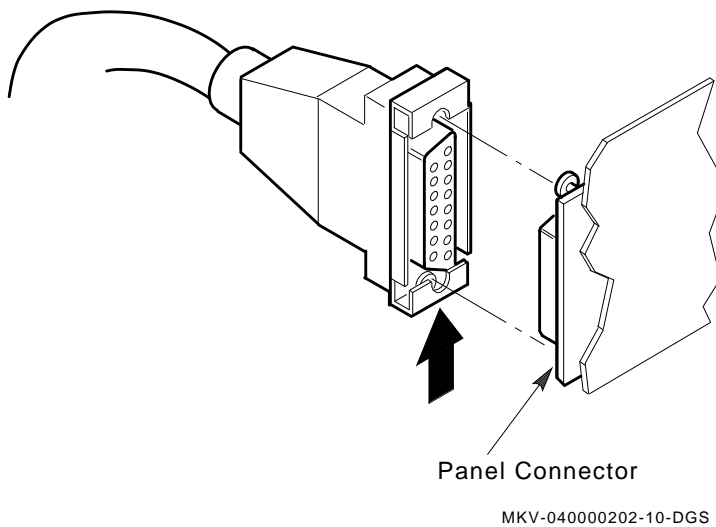


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## Tabletop Installation

2. Find a workstation cable (it has a D-shaped connector).
3. Align the cable's D-shaped connector with the D-shaped DELNI panel connector (1—8) (see Figure 2-3).
4. Slide the cable connector latch up with your finger if the latch is not already up (see Figure 2-3).

**Figure 2-3 Cable/Panel Connection**

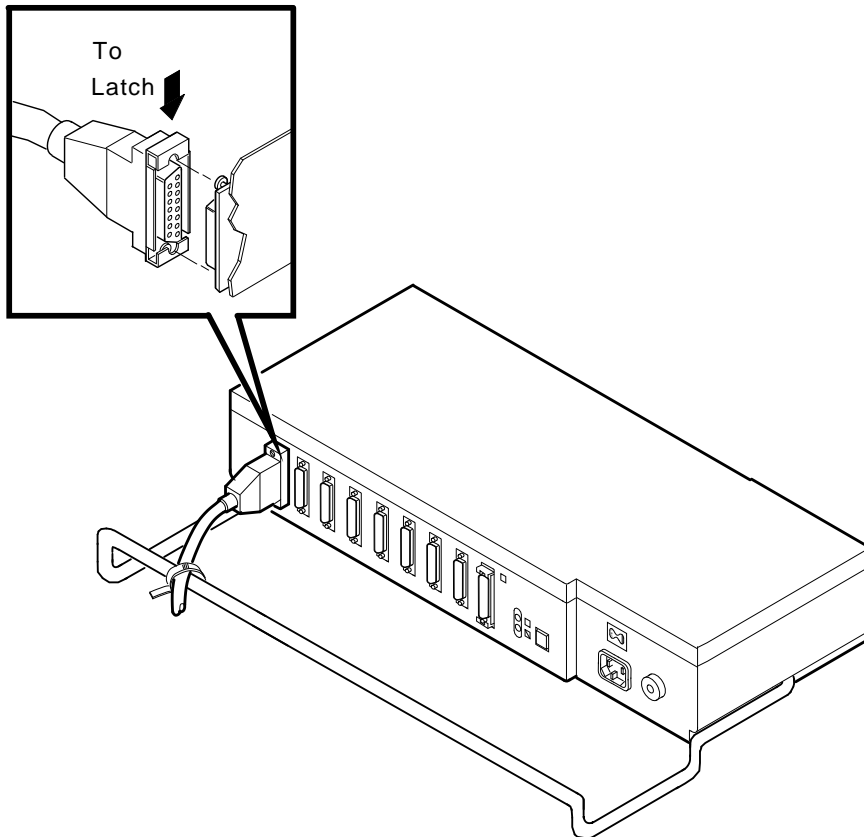


5. Slide the cable connector on any panel connector (1—8). Ensure that it is on all the way.

## Tabletop Installation

6. Slide the cable connector latch down with your thumb (see Figure 2-4).
7. Gently pull the connector to ensure that it is on firmly.

**Figure 2-4 Cable Connector Latch**



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## Tabletop Installation

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### NOTE

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If you are connecting the cable to another DELNI unit or transceiver, use connector 9 and follow these steps:

- Push slide on panel connector up.
  - Push connector on.
  - Slide latch down.
  - Gently pull to ensure that the connector is on firmly.
- 

8. Find another workstation cable and attach it to any other panel connector (1—8) in the same way as was done for the first cable.
  9. Attach the rest of the workstation cables in the same way. Ensure that you neatly place the cables away from where people may walk. Tie-wrap each cable separately to the cable support.
- 

### NOTE

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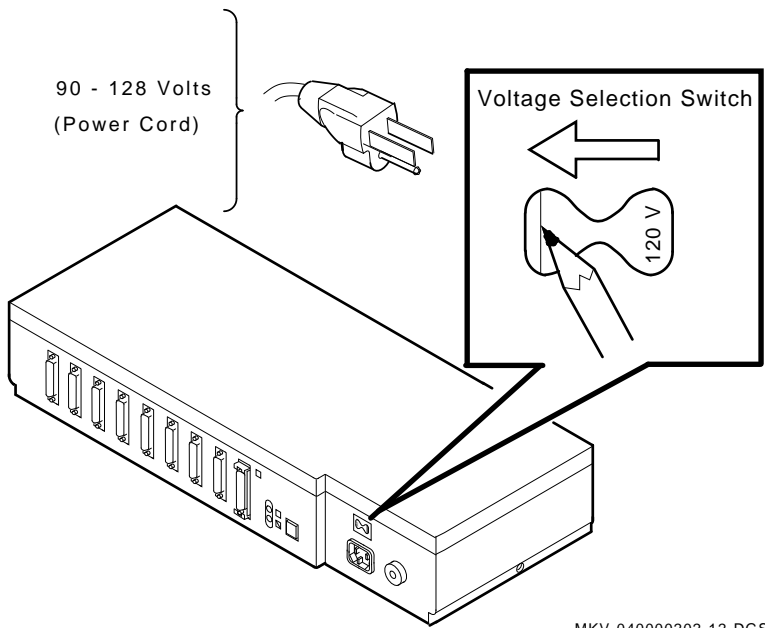
You do not have to use all of the connectors. You can add other cables at any time.

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## Tabletop Installation

10. If your power line voltage is 90 Vac to 128 Vac, slide the voltage select switch to 120 (see Figure 2-5).

**Figure 2-5 Voltage Select 120 Vac**

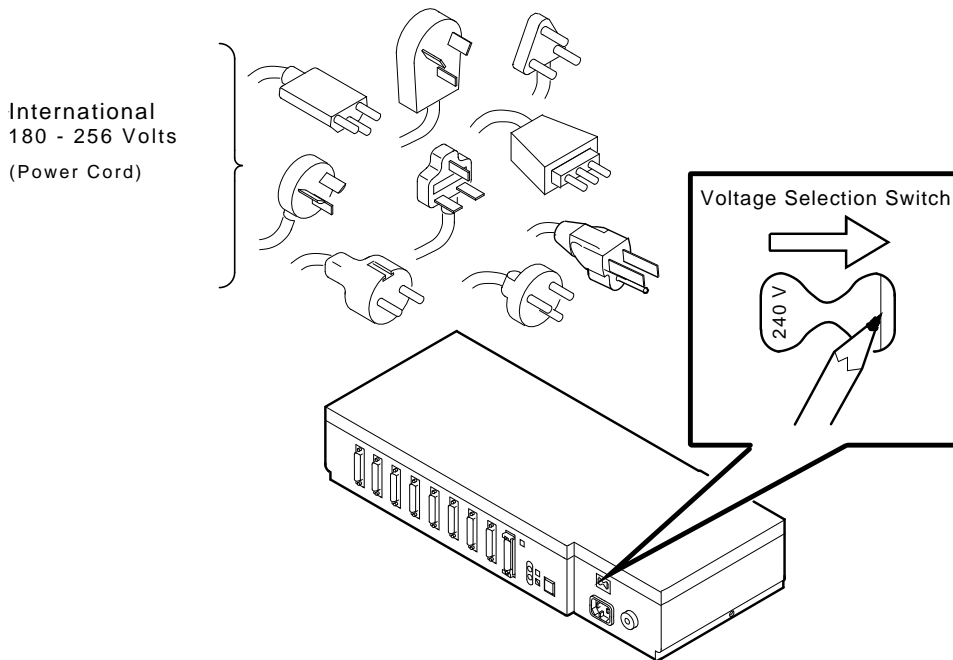


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## Tabletop Installation

11. If your power line voltage is 180 Vac to 256 Vac, slide the voltage select switch to 240 (see Figure 2-6).

**Figure 2-6 Voltage Select 240 Vac**

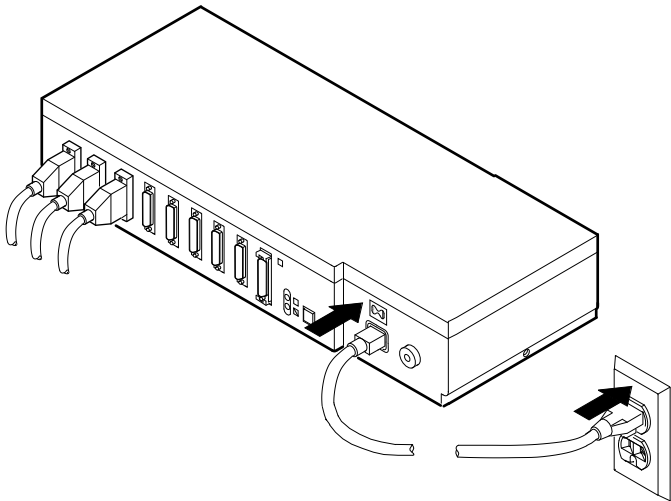


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## Tabletop Installation

12. Insert the power cable in the socket on the DELNI panel (see Figure 2–7).
13. Plug the other end of the power cable into the wall socket (see Figure 2–7).

**Figure 2–7 Power Cable Connection**



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One of the LEDs next to the local/global push button on the front of the unit should now be on.

If either of the LEDs is lit, you have correctly installed your DELNI unit.

If neither of the LEDs next to the local/global push button is lit, check the steps you performed in this chapter. If you performed all the steps correctly and neither of the LEDs is lit, go to Chapter 4 for troubleshooting help.

## Tabletop Installation

14. Set the local/global LEDs for your type of installation as shown in Figure 1–5 through Figure 1–7.

Note the  symbol above connector 9. If you are using connector 9 on this unit to connect to another DELNI unit, Etherjack junction box, or Ethernet network transceiver, then press the push button until the green LED next to the  symbol is lit. Otherwise, press the push button until the green LED next to the  symbol is lit. Chapter 1 can also be referred to for information about setting these LEDs.



# 3

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## Rackmount Installation

### 3.1 Introduction

This chapter informs you on how to install the rackmount assembly for the replacement DELNI (Digital Ethernet Local Network) unit. The assembly fits in a standard 19-inch (48.26-centimeter) rack. The basic operating and troubleshooting instructions for the replacement DELNI unit are in Chapter 2 and Chapter 4 of this manual.

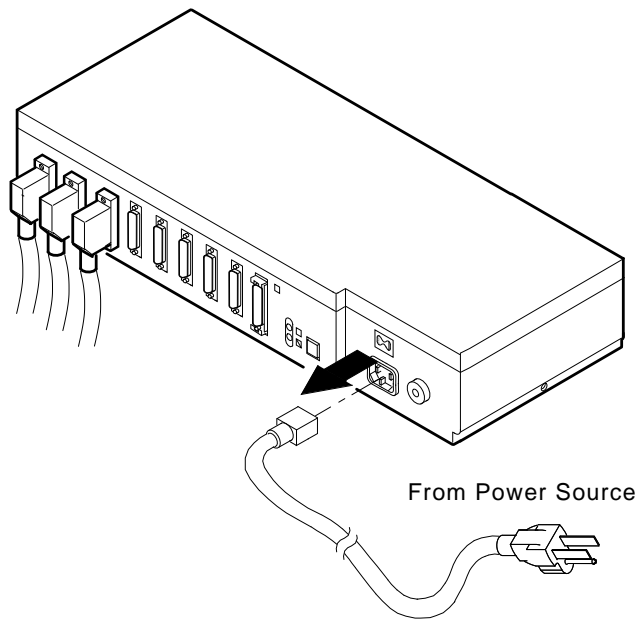
### 3.2 Installing the Rackmount DELNI Unit

If your DELNI unit is connected and in use, begin with step 1. If you are mounting and connecting your DELNI unit for the first time, read this manual and then begin with step 3.

## Rackmount Installation

1. Remove the power cable from the power source and the DELNI panel connector (see Figure 3-1).

**Figure 3-1 Disconnecting the Power Cable**



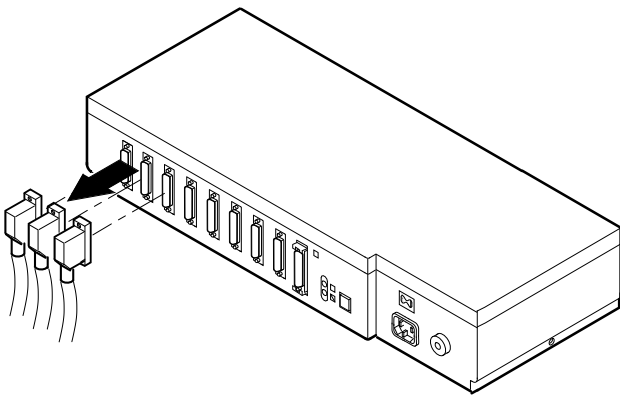
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## Rackmount Installation

2. Remove all connectors from the DELNI panel (see Figure 3–2).

**Figure 3–2 Disconnecting the Connectors**

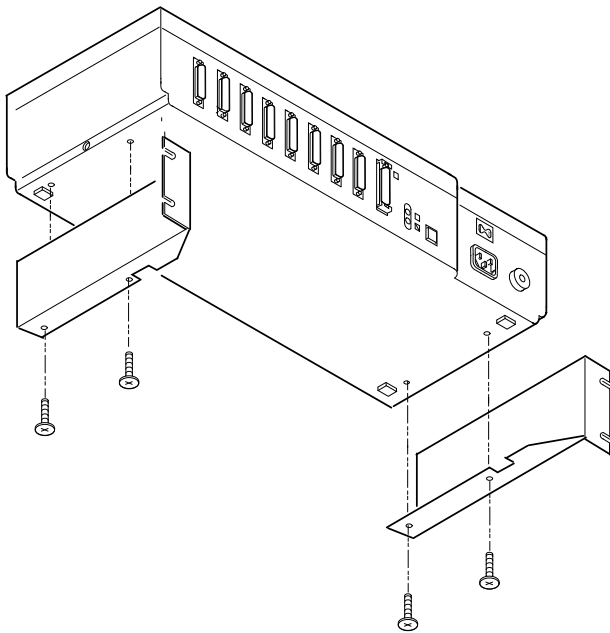


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## Rackmount Installation

3. Attach the rackmount brackets to the DELNI unit with the four 6-32 X 5/16 inch screws (see Figure 3-3). Tighten firmly.

**Figure 3-3 Attaching the Rackmount Brackets**

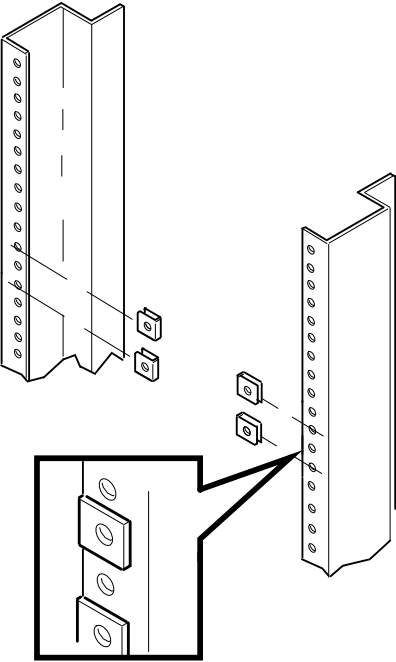


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## Rackmount Installation

- 4. Slide the four locknuts onto the rack (see Figure 3-4). Align the hole in the rack with the hole in the nut.

**Figure 3-4** Installing the Locknuts on the Rack

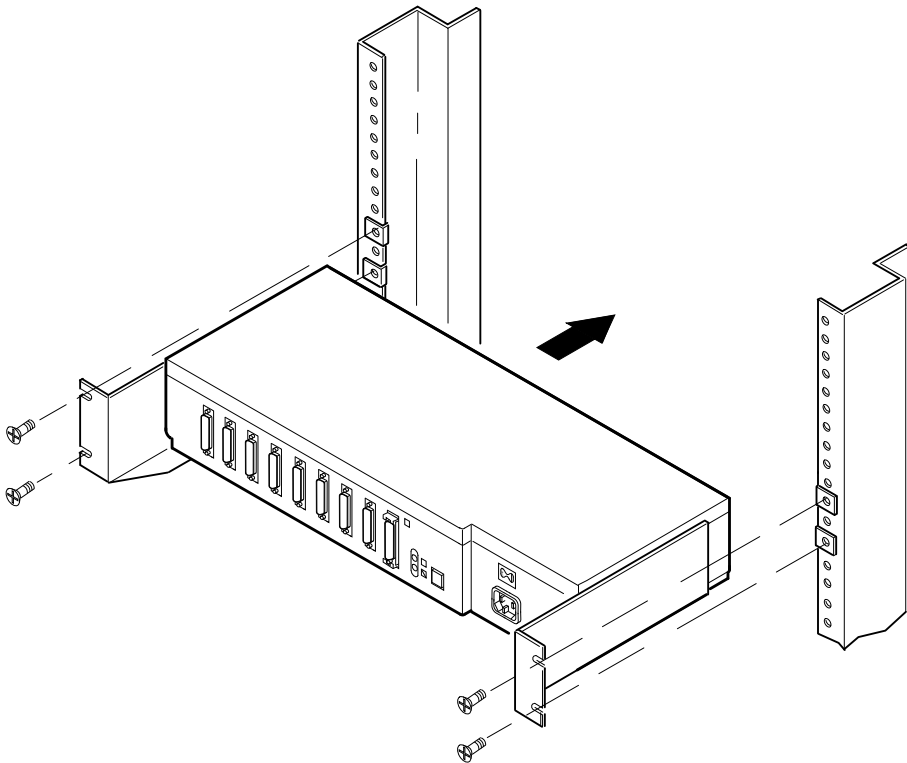


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## Rackmount Installation

5. Attach the DELNI assembly to the rack with the four large 10-32 screws (see Figure 3-5). Tighten firmly.

**Figure 3-5 Attaching the DELNI Assembly to the Rack**



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## Rackmount Installation

6. Attach the workstation cables. Test the connections by pulling the connections gently. See Chapter 2 (steps 2 through 9) for instructions.
7. Check the voltage select switch for the correct voltage setting. See Chapter 2 (steps 10 or 11) for instructions on how to set the voltage switch.

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**NOTE**

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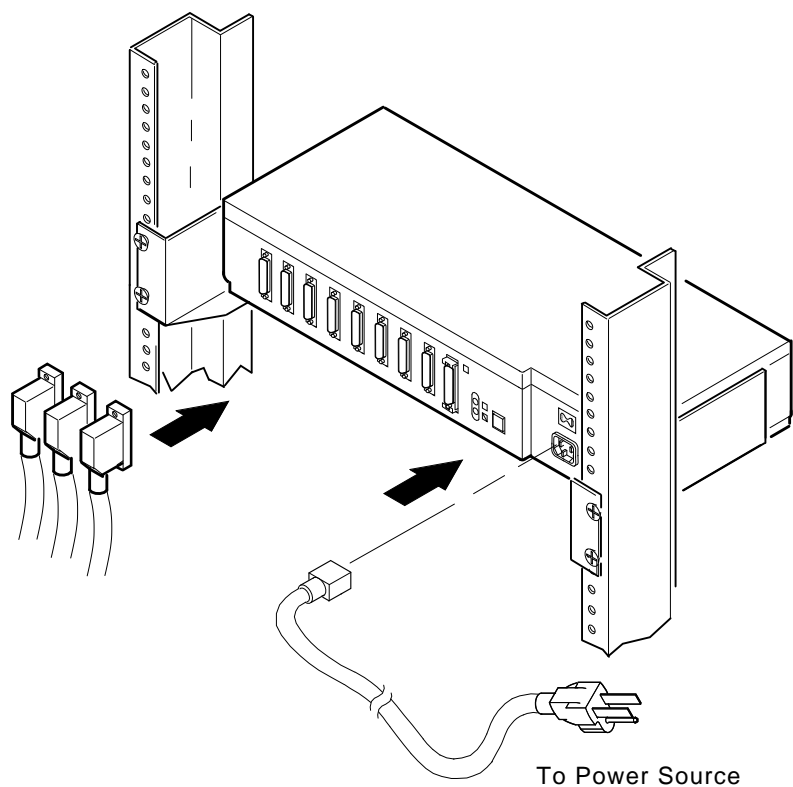
You may need to order a different power cable to match the voltage and power connector in your rack's power supply.

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## Rackmount Installation

8. Attach the power cable to the DELNI panel connector and then to the power source (see Figure 3–6).

**Figure 3–6 Connecting the Power Cord on the Rackmount DELNI Unit**



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9. Check to see if the correct local/global LED is lit. See Chapter 2 (step 14) for instructions on how to set the local/global LED state.

You have completed the rackmount installation for your DELNI unit. See Chapter 1 and Chapter 2 for further information about its operation and how to use it.

# 4

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## Troubleshooting

### 4.1 Introduction

This chapter explains how to identify problems in your DELNI unit and how to perform some simple procedures to fix these problems. The DELNI unit contains no user-serviceable parts and must be returned to Digital for any internal repair.

### 4.2 Improper Local/Global Configuration

If a user connects the DELNI unit in a local cluster with no backbone connection or other transceiver connected to the global port, and then sets the unit to global mode, the DELNI unit will not function. This is due to the fact that the local/global push button changes the data path. In local mode, the data path is directly from the transmit pair of the active port to the receive pairs of all eight local ports. There is no logical connection to the transceiver port in this mode. There will be +12 Vdc at the global connector, but no data.

In global mode, the transceiver becomes part of the data path. Therefore, if the transceiver is missing or improperly terminated, the data path breaks down, and units in a local cluster will not communicate through the DELNI unit.

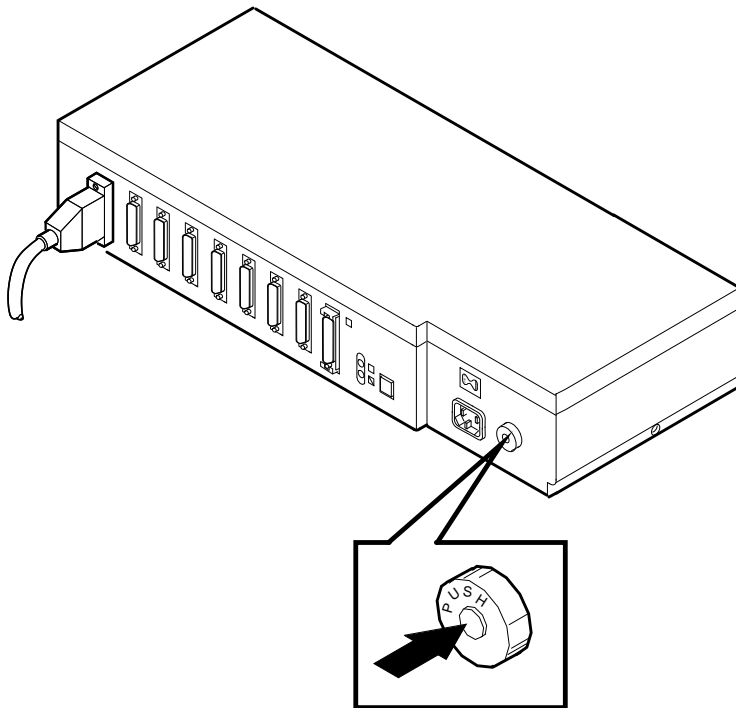
In global mode, the transceiver is dependent upon the DELNI unit to provide +12 Vdc power on connector 9. If the DELNI unit fails to produce +12 Vdc, the network transceiver will not function. The green LEDs only indicate the presence of +5 Vdc. If connector 9 is connected to another DELNI unit in a two-tier DELNI LAN as in Figure 1-6, the loss of +12 Vdc will not be apparent as the upper tier DELNI unit does not require the +12 Vdc. To verify the presence of +12 Vdc, an Ethernet loopback connector (P/N 12-22196-02) can be placed on connector 9. If the green LED on the loopback connector is not lit, the +12 Vdc supply in the DELNI unit is at fault and the unit must be replaced.

## Troubleshooting

### 4.3 Neither Local/Global LED Lights

If neither of the two LEDs on the front panel is lit, there may be a power fault. First, ensure that there is power at the socket (try plugging a lamp into the socket). Check the voltage selection switch as described in Chapter 2 and then check the circuit breaker. If necessary, reset the circuit breaker by pushing in the center button on the circuit breaker as shown in Figure 4–1. If both LEDs remain unlit, the unit must be replaced.

Figure 4–1 Resetting the Circuit Breaker



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### 4.4 Other Hardware Problems

If you have problems using the DELNI unit, the fault may be in the workstation, the cable between the unit and the workstation, or the unit itself. First, run any available diagnostics (refer to the workstation's owner's manual). Then, if diagnostics do not locate the problem, continue troubleshooting. Troubleshooting involves substituting working components, one by one, until you find the defective component.

#### 4.4.1 Is the Workstation at Fault?

Perform the following steps to check for a faulty workstation:

1. Substitute a workstation that you know works correctly for one that shows the problem. Substitute only the workstation and not the connecting cable.
2. If the new workstation works correctly, the workstation you just removed is faulty. Refer to that workstation's owner's manual for corrective action.

If the problem continues, the cable or unit is faulty.

#### 4.4.2 Is the Cable at Fault?

Perform the following steps to check for a faulty cable:

1. Remove the connector for the cable between the unit and the workstation that shows the problem.
2. Connect a cable that you know works correctly to this connector. You can use a cable from another workstation.
3. Connect the other end of this cable to the same workstation that shows the problem.
4. If the workstation works correctly, the cable you just removed is faulty. Replace the defective cable.

If the problem continues, the unit is faulty.

## Troubleshooting

### 4.4.3 Is the DELNI Unit at Fault?

If some of the DELNI panel connectors are not in use, and some of the connectors in use are not working, connect working cables and workstations to the unused connectors. The unused connectors may not be faulty. If different connectors work, use these until you can arrange to have your unit serviced. If none of the connectors work, perform the following test:

1. Disconnect all cables from the DELNI panel.
2. Substitute a unit that works correctly for one that shows the problem.
3. Connect all the cables to the working unit. If all workstations work correctly, the original unit is faulty. Replace that unit and return it to Digital for repair.

If the problem continues, then start over again by troubleshooting the workstation and the cables.

## 4.5 Software Problems

The DELNI unit does not depend on software to operate. If you do not have the appropriate software for your workstation, however, you may have communication problems.

Ensure that you have the latest version of Ethernet network software correctly installed in your workstations. You may want to reload this software into all appropriate workstations before you test again.

# 5

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## Service Options

### 5.1 Introduction

Chapter 4 described which steps you should follow before you call for service. This chapter describes the repair and support services available from Digital.

### 5.2 How to Get Service

Digital has a central service point in your geographic area to help you get your system running with a minimum of trouble.

If your DELNI unit is on warranty, or if you have a service contract, you can call Digital for assistance.

Before you call:

- Step through Chapter 4 in this book. Often you can solve a problem yourself.
- Write down your DELNI serial number. The serial number is on the DELNI unit.
- Summarize the problem. Make a note of what you were doing when the unit failed. Also note the steps you took and the cables and devices you switched when troubleshooting.

## **Service Options**

When you call:

- Be near the unit.
- Have all your materials available. The service person may ask you to try and recreate the problem.

Call Digital at the following telephone number:

United States

Call 1-(800)-554-3333

### **5.3 Repacking the DELNI Unit**

If you have to return the unit to Digital for service, you must repack it carefully. Use the original shipping carton and shipping material. If you do not have the original shipping materials, pad the sides to prevent damage and to keep the unit from moving in the carton.

### **5.4 Digital Services**

Digital provides a wide range of DELNI maintenance and customer services.

#### **5.4.1 Digital On-Site Service**

Trained service specialists perform fast, low-cost maintenance at your site. Digital provides on-site service under a service agreement or on a per-call basis.

#### **5.4.2 Carry-In Service**

There are 160 Servicenters worldwide, offering fast, dependable service. Digital provides carry-in service under a service agreement or on a per-call basis. Call the service information number listed above for the location of the Servicenter near you.

#### **5.4.3 Other Services**

Digital also provides network planning services. These include site surveys, installation, and consultations about your network installation. There are also network maintenance agreements that can give you support for both Digital and non-Digital equipment. Call your local sales office for complete information.

# A

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## Etherjack Connection

### A.1 Connecting Cables to an Etherjack Junction Box

This appendix describes how to connect cables to an Etherjack junction box.

The Etherjack junction box is a connection point for two cables. You can use it between two lengths of cable, or as the connecting point for a cable and other network equipment. An H4005 transceiver is not usually accessible and, therefore, has a cable connected to it. This cable is installed in the Etherjack junction box for connection to other network equipment.

There may be restrictions on the total distance between equipment to be added to an H4005 transceiver or a second DELNI unit. Check the installation manual that came with your network equipment or the Ethernet controller for your workstation. You may have to rearrange your equipment if it has restrictions. Typically, the maximum distance you can have is 45 meters (147 feet, 8 inches), although some workstations allow less. For example, the DEUNA Ethernet controller for the PDP-11 or VAX systems cannot be more than 35 meters (114 feet, 10 inches) from a second DELNI unit or an H4005 transceiver. Contact your local Digital sales office for more information about installing your network system.

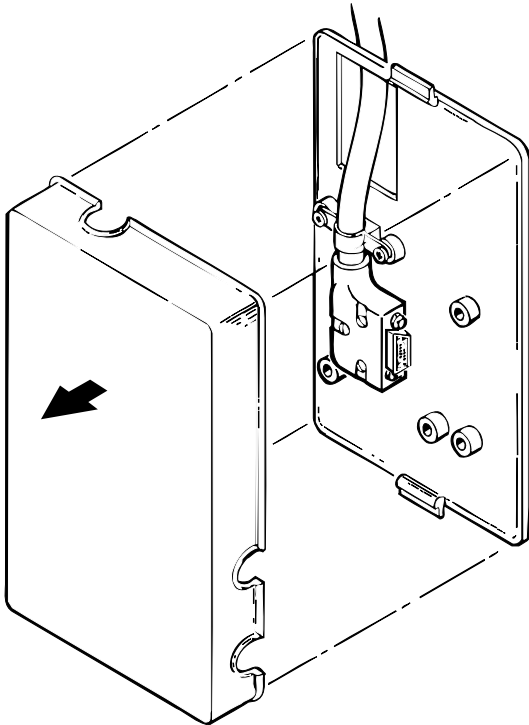
Each Etherjack junction box has a specifications label inside the cover. This label lists the length of the cable that connects the Etherjack junction box to other network equipment, DELNI unit, or H4005 transceiver. Ensure that you include this length when you calculate the total cable length. Another label inside the Etherjack cover shows several cable arrangements.

## Etherjack Connection

Perform the following steps to connect cables to the Etherjack junction box:

1. Snap off the Etherjack cover (see Figure A-1).
  - a. Pry out one side.
  - b. Lift off the cover.

**Figure A-1 Removing the Etherjack Cover**

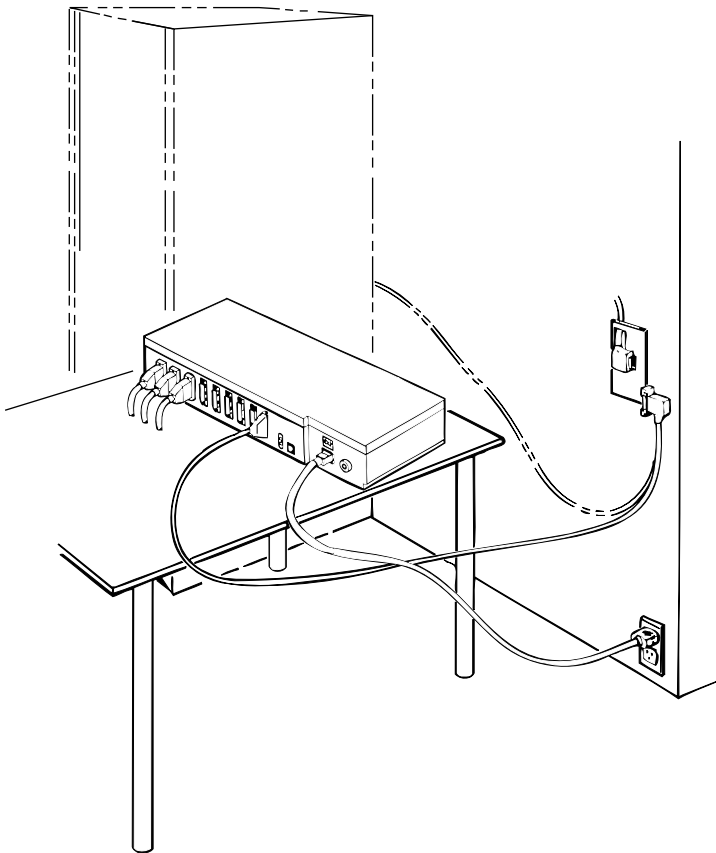


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## Etherjack Connection

2. Bring the workstation or network hardware cable and connector to the Etherjack junction box (see Figure A-2).

**Figure A-2 Network Cable Connection**



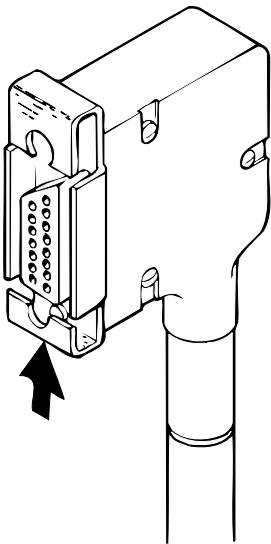
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3. Align the connector on the cable to the connector in the Etherjack junction box.

## Etherjack Connection

4. With your finger, slide the cable connector latch to the open position (up), if not already open (see Figure A-3).

**Figure A-3** Opening the Connector Latch



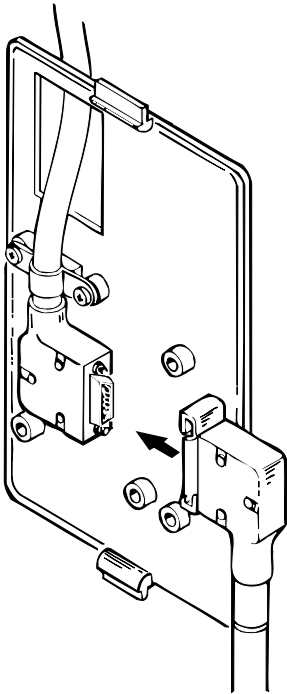
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## Etherjack Connection

5. Push the connectors together (see Figure A-4). You may have to loosen the clamp that holds the connector in place.

**Figure A-4 Joining the Connectors**

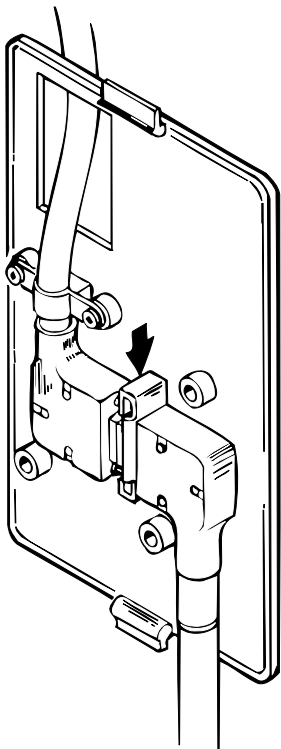


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## Etherjack Connection

6. Slide the latch in the other direction (down) (see Figure A-5).
7. Pull the connectors firmly to ensure that they are attached.
8. Push the cable into the strain relief clip.

**Figure A-5 Closing the Connector Latch**

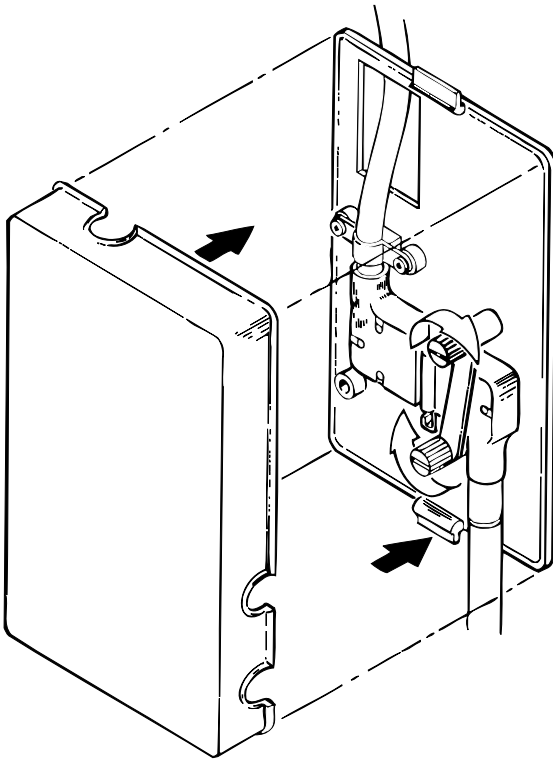


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## Etherjack Connection

9. Attach the clamps that hold the connectors in place (see Figure A-6).
10. Snap the Etherjack cover into place (see Figure A-6).

**Figure A-6** Installing the Clamps and Cover



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# B

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## Ethernet Controller Cable Length Restrictions

The Ethernet controller has certain cable length restrictions.

The following are maximum lengths for the DELNI LAN arrangements.

Standalone (local) DELNI LAN	40 meters (131.24 feet) from Ethernet controller to DELNI unit
Two-tier DELNI LAN	40 meters (131.24 feet) from Ethernet controller to DELNI unit and 50 meters (164.05 feet) from DELNI to DELNI unit
Connected (global) DELNI LAN	35 meters (114.84 feet) total length from Ethernet controller to DELNI unit to H4005 transceiver

